CASIO EDUCATION

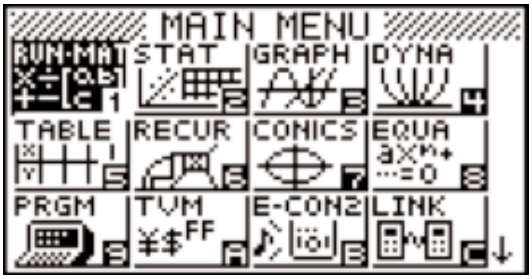
Algebra 1 SneakPeek

Get a Sneak Peek into Algebra I using Casio's fx-9750GII!

INSIDE YOU'LL FIND:

- An Icon guide to show you what applications you'll use the most
- Understand "Casio" language quickly and easily
- Tips to start using your calculator in minutes!
- Algebra tips that you'll use throughout the year in Algebra I

When you turn on your new calculator, there is no more guessing "where do I go from here?" You use the Icon Main Menu as your on-screen guide, just like a computer.



There are 14 icons but the 7 you may use the most in Algebra are listed below:

Icon	Menu Name	Description
	Run•Mat	Where you perform all of your calculations
	Stat	Determine mean, median, mode and other information about a set of data
	Graph	Draw the data on a coordinate plane
	Table	See the relation as numbers rather than as a graph
	Equation Solver	Gives you the answer when you enter the equation
	Time Value of Money	Perform various financial calculations
	System	Allows you to manage memory settings on your calculator

Casio Algebra I Sneak Peek

Introduction

You're probably thrilled - rather than getting something you really wanted, like a new game for your gaming system, you got a graphing calculator – SWEET! It's great, really, how excited can you get over a graphing calculator? Well, let's just say, you have a graphing calculator that can do a bunch of stuff that your friend's graphing calculator can't and your's can do it faster – so, it's a win-win; you beat your friends, get better grades in Algebra and have your parents and teacher think you're a genius…

Algebra can be pretty tricky sometimes and hopefully, you'll have a teacher who will explain things in a way you understand. Now, you have a graphing calculator that can help with basic calculations, making graphs, tables, and yes, even solve equations! (Sshh…your teacher may not tell you how to use the Equation Solver, but I am going to!)

Take a few minutes to read through this Algebra I Sneak Peek, you'll pick up a few tips to help you out this year. You don't have to go through it all at once – you can just go through it as you need. Within minutes, you'll be using your *fx-9750GII* like an expert! You'll be able to find answers faster and easier than some of your classmates but you don't have to tell anyone if you don't want to!

SECTIONS:

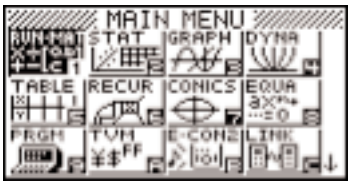
1. Introduction
2. Screen & Keyboard
3. Relation Keys / Soft Keys
4. Run•Mat: Option
5. Basic Graphing
6. Graph: G to T
7. G-Solv
9. Table
11. Equation Solver
12. TVM
13. Memory
14. Conclusion

Screen & Keyboard

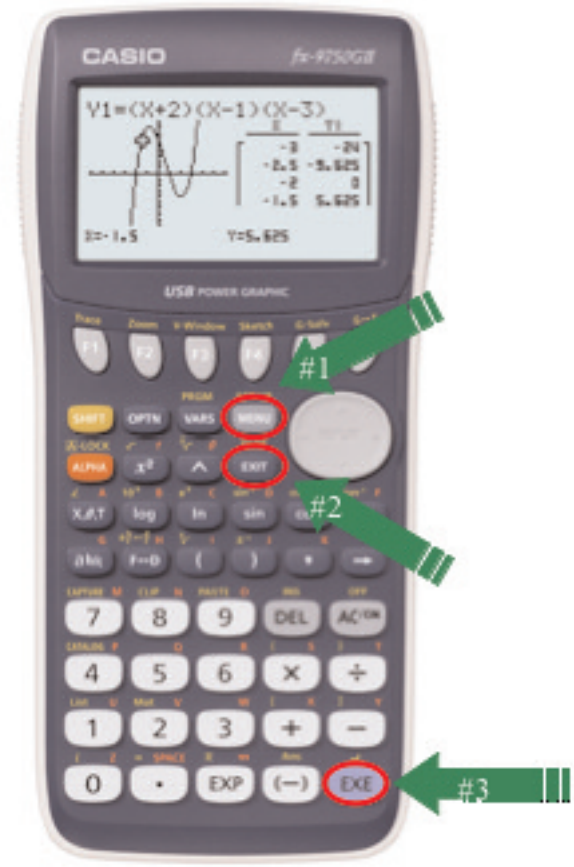
FIRST THINGS FIRST, HOW DO YOU GET WHERE YOU NEED TO GO?

Two ways:

1. Use the to move to the icon you want and press EXE.
2. Press the number or letter of the icon you want on the keyboard – Done! For example, if you want to graph something, just press 3.



NOW, TAKE A LOOK AT THE KEYBOARD...



You can work most electronics; in fact, you probably didn't even have to look at the manual because you could figure it out yourself and teach your teacher how to use it in no time – always fun to teach your teach something for a change!

These three buttons will help you navigate around the calculator and get you out of most mistakes you might make:

❶ MENU =

This key always brings you back to the Icon Main Menu -it's like the home icon on your web browser. Whenever you press MENU, you can immediately get out of any application you are using and come right back to Main Menu and you won't lose what you are working on previously!

❷ EXIT =

We all make mistakes. The EXIT key operates like the back arrow on your web browser; it will take you back one screen each time you select it. Rather than panic and get frustrated, just go to the EXIT button! Unfortunately, the EXIT button will not take you to the Icon Main Menu.

❸ EXE =

This key stands for "Execute", which is the key you press to execute operations; basically, have the calculator "do stuff". It's at the bottom of your keypad and any time you want an answer or need to enter information, just use that button.

Function Keys / Soft Keys

These keys "correlate" with the on-screen menu choice tabs. Correlation is "math speak" for "goes together" and no, not like you would with the really hot person in 5th period.

Alright, check these out…

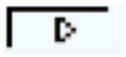
These relation or "soft keys" do different things depending upon which icon menu you're in. Basically, they allow you to choose from the on-screen menu options or to access the function written in yellow directly above the keys.

THERE ARE ALSO THREE DIFFERENT KINDS OF SOFT KEY MENU OPTIONS:

a white background does the command instantly when the key is pushed

a black background means the command can be inserted like the ! symbol for factorial. If you wanted to calculate 5!, you would enter 5 then select the soft key for x!.

a black background with a bent corner means there is another set of soft keys to use after you press this soft key



When you see F6 (▷), it means there are more on-screen choices.

With the *fx-9750GII*, you have all of the information in front of you - just pay attention to the screen and let it guide you.

The Run Icon

Bad Joke Alert: This icon menu has a lot of legs; allowing you to go the distance in Algebra!

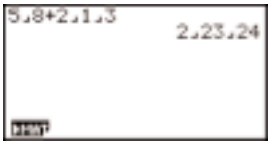
Ok, you'll be spending a lot of time here, this is where you do all the fun stuff like add, subtract, multiply & divide and the really fun stuff like fractions, decimals, square roots, exponents, probability (the combination of stuff you can do is sick!)

The *fx-9750GII* has a sweet "fraction key" $a\frac{b}{c}$ that allows you to enter any fractions and a "fraction to decimal" key F↔D so you can change answers back and fourth at the touch of a button.

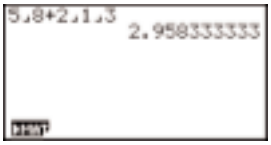
Quick Example: Let's say you didn't want add $\frac{5}{8} + 2\frac{1}{3}$ by hand (duh!); this is how you would enter it on your calculator:

Press 5 $a\frac{b}{c}$ 8 + 2 $a\frac{b}{c}$ 1 $a\frac{b}{c}$ 3 EXE

However, if Ms. So and So wants your answer as a mixed number, just press: SHIFT F↔D $(a\frac{b}{c} \leftrightarrow \frac{d}{c})$.



And if she wants your answer as a decimal, press F↔D and you're done!



CAUTION...Math Ahead!

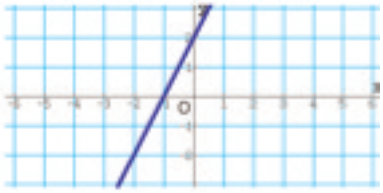
Most teachers haven't liked the look of "improper" fractions but this year, you'll actually use fractions more because you'll be dealing with the slope of lines which is represented by a fraction – remember "$\frac{\text{rise}}{\text{run}}$", that shows a change in your x- and y-values.

Here's the formula for slope (m) to keep handy: $m = \frac{y_2 - y_1}{x_2 - x_1}$

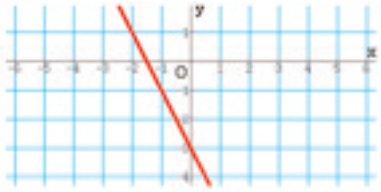
YOU CAN HAVE 4 TYPES OF SLOPE:

Going from left to right (yes, we "read" math the same direction we read words):

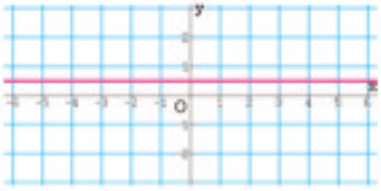
• If your line goes "uphill" it has a positive slope.



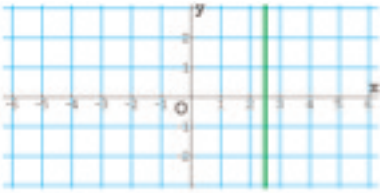
• If your line goes "downhill", it has a negative slope.



• If your line is completely flat, like so flat that if you put a rock on it, it would roll 0 feet, then your line has a slope of 0.



• If your line is straight up and down, meaning you couldn't ride a bike down it without crashing to your death, we say it has "undefined" slope.



You like options, don't you? If your teacher gave you an option of doing your homework or not, you probably would "opt" to not do it, right? Well our OPTN key gives you plenty of on-screen options regardless of where you are in the calculator!

Chances are, if you can't find the key you are looking for (value, permutations, combinations, and random numbers, etc.), you'll probably find it under the OPTN key - except for things like love, money & cars.

When you look through this menu, you'll see lots of stuff you won't need for Algebra but trust me, that stuff is just a few fun years away!!!

CAUTION...Math Ahead!

In Algebra, you'll be working with expressions- meaning something that does not contain an equality sign. While working expressions, you might have to substitute values for specific variables and "simplify" an expression, using order of operations to calculate its value.

For example, you might be asked to simplify the expression $2b^3 + 8b$ when $b = 4$.

Here's how you might simplify this expression by hand:

$$2(\ )^3 + 8(\ )$$
$$2(4)^3 + 8(4)$$
$$2(64) + 8(4)$$
$$128 + 32$$
$$160$$

With your *fx-9750GII*, you can quickly simplify this expression by telling the calculator you want 4 to replace b in the expression and simplify this in a flash.

To store 4 as the value for *b*, press: 4 → ALPHA log EXE

Now enter the expression: [2] [ALPHA] [log] [^] [3] [+] [8] [ALPHA] [log] [EXE]

Keep in mind, like other graphing calculators you may have used, the *fx-9750GII* is programmed to follow the rules associated with Order of Operations. Remember, grouping symbols, like parenthesis, are always "dealt with" first- the use of parenthesis can make or break a problem in math!

One example that bites students in the tail can be seen with the following problem:

$(-11)^2$ vs. -11^2

You need to remember that $(-11)^2 = (-11)(-11)$, where as, when the calculator sees -11^2 it thinks $-(11)(11)$ and leaves the negative sign out front. This will result in two different answers, so be careful on how the question is asked in your math class.

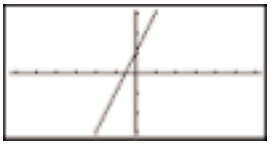
Basic Graphing

Alright, you got this graphing calculator to do some graphing, right? First, enter the Graph module and from there, you can enter any relation you like.

The most important key here is the "variable key" [X,θ,T]. You'll use this key to enter a variable, represented by the letter x. There are other variables on the key and you'll get to those in a few years (betcha can't wait!).

To enter the relation, y = 2x + 1, make sure the line you want is highlighted then, press [2] [X,θ,T] [+] [1] [EXE] to store the relation.

What do you want to do?? Right, you want to draw the graph, so press [F6] (Draw).



CAUTION...Math Ahead!

The relation you just entered is also called a linear relation. A linear relation represents the relationship between two variables, that when graphed, forms a line. In this relation, the two variables used are x and y. x is usually recognized as the independent variable and y is usually recognized as the dependent variable; your teacher may also refer to them as input & output values.

(x, y) = (independent, dependent) = (input, output)

Remember in middle school when you learned these symbols? ≤ ≥ < >

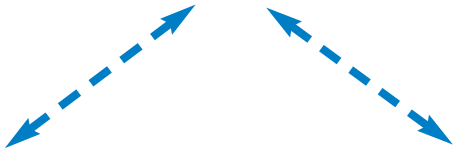
And your teacher asked you to graph those on a number line?

For example: n ≤ -1

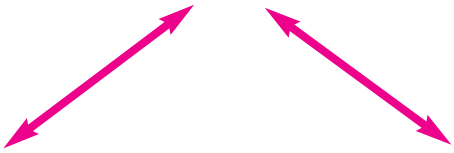
Well, this year in Algebra you're going to take it a step further by learning how to graph a linear inequality. Linear inequalities are set up the same as a linear relation, but with one change; instead of an equal sign, you'll use an inequality symbol.

Just like you would draw an inequality statement on a number line with open or closed circles and arrows drawn or shading to the left or right, there are a few things that need to be added in order to draw a linear inequality.

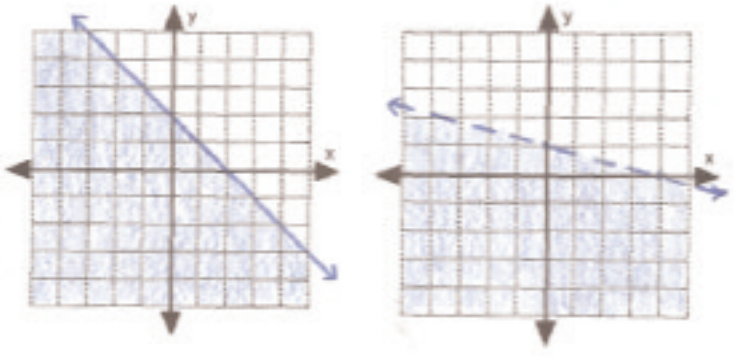
If the symbol is < or >, the "line" drawn needs to be dashed/dotted. This means that no solution to this problem can be found on the line itself.



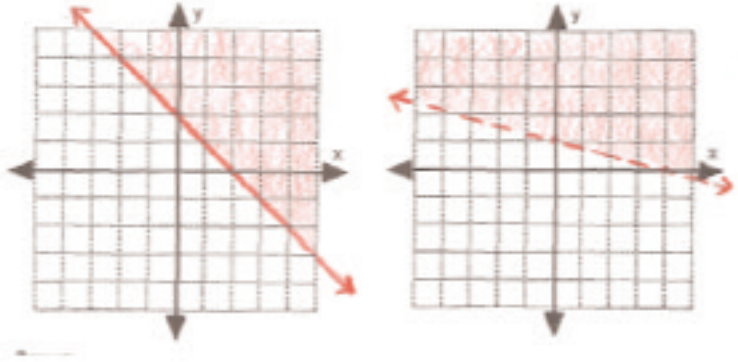
If the symbol is ≤ or ≥, the "line" drawn needs to be a solid line. This means the line actually includes answers, as well as the shaded region.



If the symbol is < or ≤, there needs to be shading below the line. It helps to start at the y-intercept and draw an arrow below; anything below the y-intercept and the line should be shaded.



If the symbol is > or ≥, there needs to be shading above the line. Once again, it helps to start at the y-intercept and draw an arrow above; anything above the y-intercept and the line should be shaded.

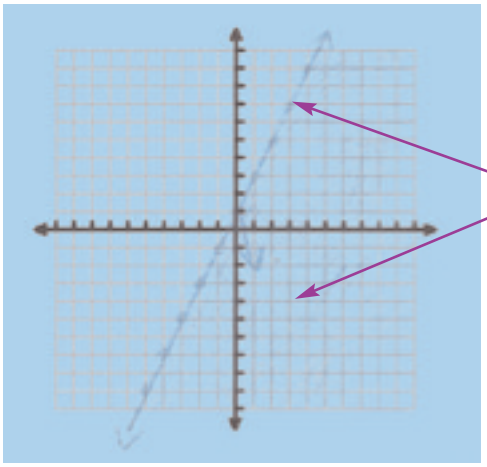


Those are a lot of new rules about graphing that you may not be comfortable with yet - that's ok!
The *fx-9750GII* can easily help you graph linear inequalities, so you can make sure your graphs are correct.

Try this example:

Graph the following inequality: $y \quad 2x + 1$

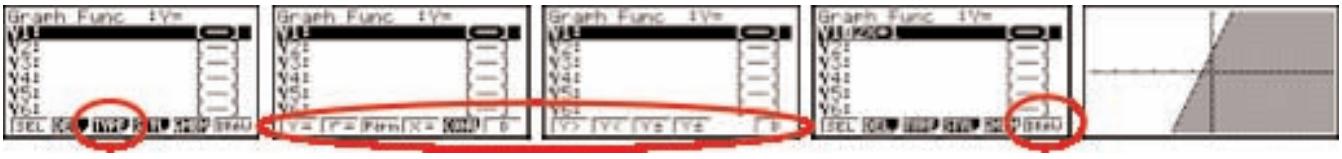
Here's what you would graph by hand:



Note:
Notice that the line is solid and the shading is below the y-intercept and the line.

With the *fx-9750GII*, you can change the type of graph you are working with; just select the type of relation you want, enter the information, and graph!

F3 F6 F4 2 X,θ,T + 1 EXE F6



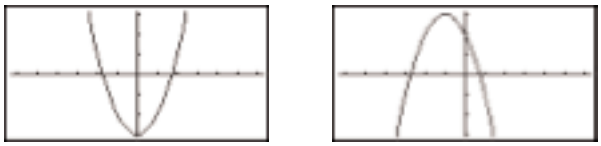
When you press F3 the first time a tab for x = equations displays. If you continue pressing F6 and scroll through the different types of graphs, notice you can also graph linear inequalities with x. How cool is that?!

Later in the year, you will start graphing equations that aren't lines; they look more like a curve. You actually see these all the time; just go to your nearest McDonald's and take a look at the trademark yellow M. These curves are called parabolas.

CAUTION...Math Ahead!

Depending on the equation, a parabola can have 2 solutions, 1 solution, or no solutions. Solutions can also be called roots, zeros, and x-intercepts. A y-intercept is the point where the graph intersects the y-axis, so an x-intercept is the point where the graph meets the x-axis.

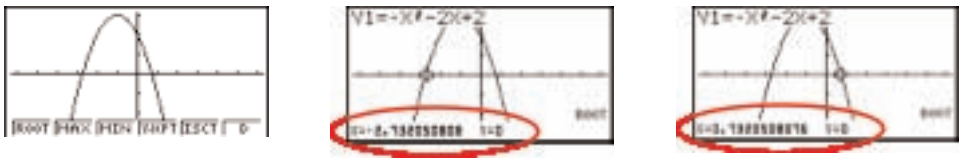
Here are examples of what a parabola could look like:



In both graphs, the parabola doesn't cross the x-axis at a whole number but you'll still be expected to find those solutions - don't worry though, your *fx-9750GII* will come to the rescue!

Take a look at the soft keys on your calculator and notice the yellow words written above each key. If you look above F5, you will see "G-Solv"; no, it's not the latest rapper whose music you should go download - it's actually going to be your new best friend.

When any graph is displayed, press F5 to activate G-Solv. A soft-menu will appear at the bottom of the screen and you'll be led to one of the graph's critical points (such as its roots). If there are multiple critical points, use the arrow keypad to move along the graph.

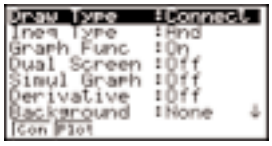


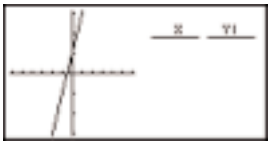
Graph to Table

You know you want information and you want it fast but what if you could get all of that information on the same screen? Think about it - your teacher asks you to draw a graph and name some points on the graph. With the G to T feature, also known as "graph to table", you can do just that.

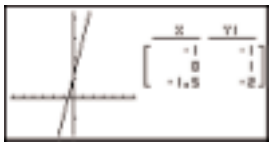
Go back to the equation used in an earlier example: y = 2x + 1. To display both the graph and the table while in Graph mode, press:

SHIFT MENU ▼ ▼ ▼ F2 EXIT F6





You can see the graph and a table, but there's nothing in the table?? The calculator is waiting for you to select the points you want in the table. Press F1 (Trace), and you can use the cursor to move to any point on the graph; to save a point to display in the table, press EXE.

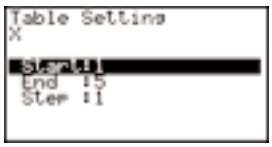


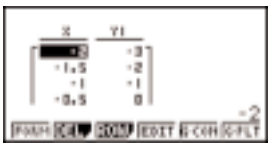
Table

Speaking of tables.... Sometimes, seeing a graph of an equation doesn't give enough information. It may be helpful to see a table of values from your graph to help you recognize patterns and gather necessary information. It's also an easy way to find slope, using the formula from earlier.

If you already have an equation entered in the Graph mode, the calculator will automatically display the same equation in the Table mode.

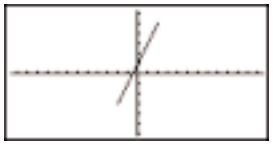
The default setting for the table is: x starts at 1, ends at 5, and increases by increments of 1. You can change this by pressing F5 (Set). Just like in the "G to T" mode, you can also customize your own table with as little or as many points as you would like.

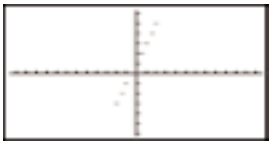




That isn't the only way to change the table settings. Frequently, it will be faster to manually enter a number anywhere in the x-column and press EXE to see the corresponding y-value (including fractions, decimals, and even).

Not only that, you can also see a graph F5 (G-CON) or plot F6 (G-PLT) for the table of values you've created. Just a thought…this is a great way to find a linear equation, if you are given two points.

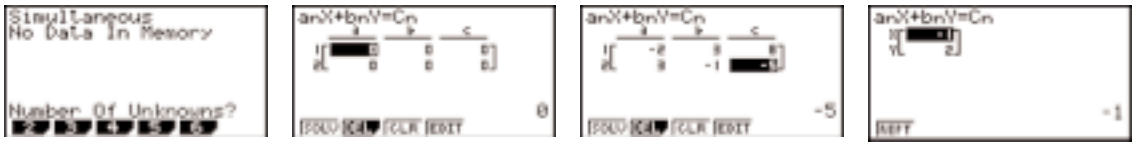




Equation Solver

Your teacher probably won't be quick to show you this feature but just keep reading ☺. Find the EQUA icon on the Main Menu. There are three soft keys: Simultaneous, Polynomial and Solver. Each of these menus will allow you to solve a different type of equation.

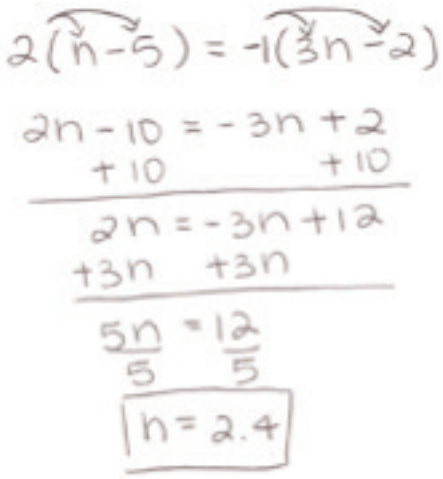
Simultaneous: Solve a "system of equations" (solving more than one equation at a time) by entering the number of unknowns you have (variables). Your equations must be in standard form. (Refer to the equation in the upper left corner of the screen to help you out.) Then, enter the coefficients for each variable and press F1 to solve.



Polynomial: This section will help you factor a polynomial. Enter the number of unknowns you have, enter the coefficients for each variable and press F1 to solve. The answer matrix shows you the x-values for the polynomial that makes it equal to zero.

Solver: This section allows you to determine the value of any variable in a formula or equation. You can enter the equation as it appears (using ALPHA) then, press F6 to solve.

If you wanted to find the value of n in the following equation, 2(n – 5) = –(3n – 2), this is how you might solve it by hand:

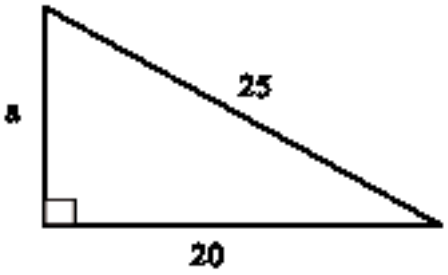


the Equation Editor screen and press:

F3 2 cos ALPHA 8 − 5 tan SHIFT • (−) cos 3 ALPHA 8 − 2 tan EXE F6

In the last screen, "Lft" and "Rgt" represent the values of the left and right side of the equation, with the calculated solution; this is the calculator's way of checking the solution. This is very helpful too, when your teacher asks you to check your work.

You can also enter one of those dreaded formulas; even if there are multiple variables! One of the more common formulas that you are probably familiar with is the Pythagorean Theorem. You can enter in the Pythagorean Theorem, assign values for the variables you know, and then solve for the missing variable.



For example:

Find the missing side of this right triangle.

If you were to solve this by hand, you might do something like this:

$$a^2 + b^2 = c^2$$
$$a^2 + (20)^2 = (25)^2$$
$$a^2 + 400 = 625$$
$$-400 \quad -400$$
$$a^2 = 225$$
$$\sqrt{a^2} = \sqrt{225}$$
$$\boxed{a = 15}$$

Here's what you would do on the calculator:

ALPHA X,θ,T x^2 + ALPHA log x^2 SHIFT • ALPHA ln x^2 EXE

Then enter your *b* and *c* values; highlight *a* and press F6 - Easy as pi!

TVM

TVM stands for Time Value of Money. This module can help you calculate simple and compound interest and can also help with exponential growth or decay problems.

For example, you can easily help your parents figure out how much they would need to pay per month for a $100,000 mortgage over 25 years, with an interest rate of 8.5%.

You could also figure out how much money you can earn if you put $1,000 in a savings account and let it earn money at an interest rate of 2.5%.

All situations that you may run in to when you start making your own money! Aren't you glad that you have something to look forward to?

System

Your teacher may ask you to reset the calculator before a test; to make sure that nothing is stored on the calculator that may give you an unfair advantage over the other kids in your class.

Press F5 F2 F1 to reset the calculator back to its default settings. Once you reset the calculator, anything that you have added or stored on the calculator is erased.